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peculiarities are here included. On the other hand albinism and alkaptonuria are recessive in heredity.

The next two chapters deal with exceptions, real or apparent, to Mendel's law, a most profitable field for students of heredity to cultivate; and the last two chapters of Part I. deal with the new light shed on biological conceptions by Mendelian discoveries and the practical application of Mendelian principles. The sociological application made, which will be of general interest, is stated concisely thus:

To the naturalist it is evident that while elimination of the hopelessly unfit is a reasonable and prudent policy for society to adopt, any attempt to distinguish certain strains as superior, and to give special encouragement to them would probably fail to accomplish the object proposed, and must certainly be unsafe.

This is a conclusion both democratic and sensible, it would seem.

Part II. contains a biographical notice of Mendel, and a translation of Mendel's two published papers on hybridization, together with a very complete bibliography, an index of subjects and one of authors.

The book as a whole will be quite indispensable to the student of heredity; the general reader will find in it much of absorbing interest, although parts will be found too technical for him to follow readily, unless he too will become, as he will be tempted to become, a student of heredity.

W. E. CASTLE

Hints for Crystal Drawing. By MARGARET REEKS, with preface by Dr. JOHN W. EVANS, Imperial College of Science and Technology, London. Longmans, Green and Co. 1908.

The accurate construction of crystal figures usually offers considerable difficulty to the beginner and it was with a view of eliminating some of these difficulties as well as adding a few short-cut methods that this book of 148 pages with its 44 plates of drawings was published.

Of the various types of projections used by the mineralogist the one known as the clinographic projection is now usually employed

and it is this projection which is chiefly considered. This is discussed in chapter I.

Chapters II. to IX., or fifty pages of the book, are devoted to directions for the drawing of crystals of the cubic system. The first three classes of this system are treated quite thoroughly and the plates illustrating a few of the common combinations aid the student in following the directions given. The tetragonal system is discussed in ten pages, the hexagonal in twenty, the orthorhombic in fourteen, and the monoclinic and triclinic in fourteen and nine, respectively, while the last eighteen pages are devoted to a consideration of twinned crystals.

In the construction of the axial crosses as well as in the drawing of the more complicated forms, the orthographic plan is first drawn and by dropping vertical projectors the corresponding points on the clinographic projection are located. This is a decided help to the beginner in pointing out the relationship existing between the two types of projections as well as for locating various points in the drawing itself.

But the text is not entirely free from criticism. The treatment throughout is from the standpoint of an experienced draftsman rather than from that of a skilled crystallographer. A few examples will make this point clear.

In the drawing of the tetragonal trisoctahedron $\{211\}$ (Fig. 1, p. 29) the intersection line P , 3 between the faces designated by II. and III. does not check with one found by the intersection of the two planes indicated. In Fig. 1, p. 35, the location of the point X can hardly be considered as accurate. The drawing of the tetragonal bisphenoid (Fig. 4, p. 65) is incorrect, for its edges should be parallel to lines joining the ends of the crystallographic axes. In the figure on page 79 the crystallographic axes are poorly drawn.

In all of the above-mentioned instances the general direction of the lines is correct, but carelessness in construction is clearly evident. This is to be regretted, for in a treatise on crystal drawing the figures should by all means be accurate. How can a student be

expected to construct correct crystal drawings if the text to which he naturally turns for comparison is lacking in this? If some of the figures had been drawn on a larger scale and then reduced these errors would have been to some extent eliminated.

Fig. 3, p. 51, is given as a combination of the plus and minus diploids. What the author has really drawn is a left gyroid (pentagonal icositetrahedron). Diploids are symmetrical to three principal planes of symmetry whereas gyroids lack these elements. The figure of chrysolite on page 105 is very poor, as the lines of intersection of the bipyramid (111) with both the macro (101) and the brachy (021) domes are incorrect.

The method of determining the position of the axes of the triclinic system is an ingenious one, being a graphic solution of a spherical triangle when three sides are given. The last chapter on twinned crystals is very instructive, as the author gives numerous practical suggestions which are of great service in the construction of these difficult forms.

The work as a whole is a marked contribution to the science of crystal drawing and is a valuable reference book in spite of the errors referred to above. WALTER F. HUNT

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The Chemical Constitution of the Proteins.

R. H. ADERS PLIMMER, D.Sc., Assistant Professor of Physiological Chemistry in, and Fellow of University College, London. In two parts. Part I. London and New York, Longmans, Green and Co. 1908.

This volume forms one of a series of monographs appearing from time to time, covering selected topics in biological chemistry and written by investigators in the subjects dealt with. The contents are divided into the chemical composition of the protein molecule and the chemical constitution of its units, or the discovery and synthesis of the amino acids. The introduction gives a list of the proteins according to the British classification followed by a complete list, with their structural formulæ, of the various protein nuclei

thus far discovered. The first section consists of a short survey of the methods employed for the decomposition of the proteins; this is succeeded by a detailed account of the method of isolation and estimation of the monamino and diamino acids, the former following the ester method of Fischer with some variations suggested by Levene and the latter employing the method described by Kossel. The results of the analyses of the various proteins made by the several authors are given in tabular form. The collection of this data and presentation in compact form forms one of the chief advantages of the book. The second section is but a compilation of data relating to the many protein nuclei covering the date of their discovery, determination of their constitution, and methods of preparations by synthesis. Some of these details have been tabulated at the end with the specific rotatory power of the natural and synthetic amino acids, mentioning by whom the observations were made. The book closes with a complete bibliography including about 500 titles and index.

The function of such a compilation must naturally be somewhat circumscribed. It can only be of value as a bibliography mainly and as a source of supply of somewhat complete data for the busy teacher who would utilize this book rather than investigate the original communications. The synthetic reactions are described by equations with structural formulæ which are undoubtedly a valuable aid to their proper understanding and elucidation. The contents are too detailed for the student; investigators and teachers would probably prefer to consult the original articles.

Practical Physiological Chemistry. A Book Designed for Use in Courses in Practical Physiological Chemistry in Schools of Medicine and of Science. By PHILLIP B. HAWK, M.S., Ph.D., Professor of Physiological Chemistry in the University of Illinois. Second edition, revised and enlarged. Philadelphia, P. Blakiston's Son & Co. 1909.

In the revision of the book the author has placed at the beginning a new chapter of